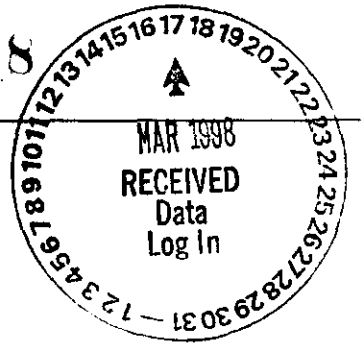
40132-TAW

RECRA LabNet

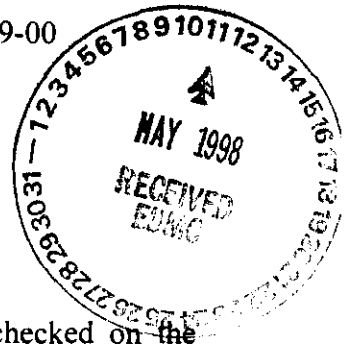
a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

0049218



Recra LabNet Philadelphia
Analytical Report



Client : TNU-HANFORD
RFW# : 9801L314

W.O.# : 10985-001-001-9999-00
Date Received: 01-29-98

METALS CASE NARRATIVE

1. This narrative covers the analyses of 1 water sample.

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits.

7. All preparation method blanks were within method criteria. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 85-115% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. Both matrix spike (MS) recoveries were within the 70-130% control limits. Refer to the Inorganics Accuracy Report. A post-digestion MS (PDS) for Iron has been included for reference purposes.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610)-280-3000 • Fax (610) 280-3041

11. A PDS was prepared at meaningful concentration levels, due to high concentrations of the following analyte:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
BOMR91	Iron	1,000	111.5

12. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

Bruce C Kutter unit leader

for J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory
skl m01-314

3-3-96
Date

METALS METHODS GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this RFW Lot#: 9801L314

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A __3010A __3015 __3020A __3050A __3051 ✓200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846	EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010A	__200.7				__99
Antimony	__6010A __7041 [5]	__200.7	__204.2			__99
Arsenic	__6010A __7060A [5]	__200.7	__206.2	__3113B		__99
Barium	__6010A	__200.7				__99
Beryllium	__6010A	__200.7				__99
Bismuth	__6010A [1]	__200.7 [1]			__1620	__99
Boron	__6010A [1]	__200.7				__99
Cadmium	__6010A __7131A [5]	__200.7	__213.2			__99
Calcium	__6010A	__200.7				__99
Chromium	__6010A __7191 [5]	✓200.7	__218.2			__SS17
Cobalt	__6010A	__200.7				__99
Copper	__6010A __7211 [5]	__200.7	__220.2			__99
Iron	__6010A	✓200.7				__99
Lead	__6010A __7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010A __7430 [4]	__200.7			__1620	__99
Magnesium	__6010A	__200.7				__99
Manganese	__6010A	__200.7				__99
Mercury	__7470A [3] __7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010A	__200.7				__99
Nickel	__6010A	__200.7				__99
Potassium	__6010A __7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010A [1]	__200.7 [1]			__1620	__99
Selenium	__6010A __7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010A [1]	__200.7			__1620	__99
Silica	__6010A [1]	__200.7			__1620	__99
Silver	__6010A __7761 [5]	__200.7	__272.2			__99
Sodium	__6010A __7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010A	__200.7				__99
Thallium	__6010A __7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010A [1]	__200.7				__99
Titanium	__6010A [1]	__200.7				__99
Uranium	__6010A [1]	__200.7 [1]			__1620	__99
Vanadium	__6010A	__200.7				__99
Zinc	__6010A	__200.7				__99
Zirconium	__6010A [1]	__200.7 [1]			__1620	__99

Other:_____ **Method:**_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).

4. Flame AA.

5. Graphite Furnace AA.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 02/06/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9801L314

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOMR91	Chromium, Total	3.1 u	UG/L	3.1	1.0
		Iron, Total	643	UG/L	3.4	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD

DATE RECEIVED: 01/29/98 RFW LOT # :9801L314

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOMR91						
CHROMIUM, TOTAL	001	W	98L0082	01/26/98	02/02/98	02/05/98
CHROMIUM, TOTAL	001 REP	W	98L0082	01/26/98	02/02/98	02/05/98
CHROMIUM, TOTAL	001 MS	W	98L0082	01/26/98	02/02/98	02/05/98
IRON, TOTAL	001	W	98L0082	01/26/98	02/02/98	02/05/98
IRON, TOTAL	001 REP	W	98L0082	01/26/98	02/02/98	02/05/98
IRON, TOTAL	001 MS	W	98L0082	01/26/98	02/02/98	02/05/98
LAB QC:						
CHROMIUM LABORATORY	LC1 BS	W	98L0082	N/A	02/02/98	02/05/98
CHROMIUM, TOTAL	MB1	W	98L0082	N/A	02/02/98	02/05/98
IRON LABORATORY	LC1 BS	W	98L0082	N/A	02/02/98	02/05/98
IRON, TOTAL	MB1	W	98L0082	N/A	02/02/98	02/05/98

RECRA LabNet Use Only
9801L314

Custody Transfer Record/Lab Work Request

RECRA LabNet

Client: TNU - Hanford
Est. Final Proj. Sampling Date:
Project #: 10985-001-001-9999-00
Project Contact/Phone #:
RECRA Project Manager: K.C.
QC: STD Del: STD TAT: 5? DAY
Date Rec'd: 1-29-98 Date Due: 2-3-98
Account #: TNUHANFORD

Refrigerator #:

		Analysis 1	Analysis 2	Analysis 3
#/Type Container	Liquid	2 P	2 P	2 AG
	Solid			
Volume	Liquid	500ml	500ml	1L
	Solid			
Preservatives		HNO3	H2SO4	H2SO4

ANALYSES REQUESTED → ORGANIC: VOA, BNA, Pest/PCB, Herb; INORG: Metal, CN; CS6; Ammonia; Oil & Grease

RECRA LabNet Use Only: MCATO MPETO; 1/1A13N; 10G5A

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	CS6	Ammonia	Oil & Grease
001	BOMR91	✓	✓	W	1-26-98	1249	✓	✓	✓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
RSA - CLIENT INFO
RMSC - COMP
SDG# HP132

Temp 4.1°

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
Fed EX	J. [illegible]	1-29-98	0945

Relinquished by	Received by	Date	Time

ORIGINAL
REWRITTEN

Discrepancies Between Samples Lables and COC Record? Y or (N)
NOTES:

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 8086 7241 2690
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package Y or (N)
2) Unbroken on Outer Package Y or (N)
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N

01

Sample Disposition Record

Control #: B98-031
Revision#: 0
Date Initiated: 2/9/98

Section 1 - BACKGROUND

SAF#: C98-022
OU: 100-NR-2
Project ID: NR2IAM(2)
Task ID:
Sampling Event: NR2IAM(2)
Laboratory: TMA/WESTON
Project Coordinator: FORD, BH
Task Manager: STEWART, DL

Section 2 - SAMPLE INFORMATION

Number of Samples: 2
ID Numbers: B0M307, B0MR91
MATRIX: Water
Collection Date: 01/26/98

Section 3 - ISSUE

Class: Lab Direction
NCR Number: N/A
Type: Other - Incorrect Method Number
Description: Both samples requested chromium by method 218.2 and iron by method 236.2. These methods are not available at ThermoNuTech.

N/A
NCR Validation (Print/Sign) Date

Section 4 - DISPOSITION

Type: Rework
Description: The lab is directed to analyze for both chromium and iron by method 200.7.

FORD, BH 2/9/98
Project Coordinator (Print/Sign) Date

~~STEWART, DL~~ CHRIS KOERNER, 2-9-98
Task Manager (Print/Sign) Date

N/A
QA (Print/Sign) Date

Section 5 - INSPECTION (Issue Class: Nonconformance Only)

Inspection Number: N/A
Inspection Results: N/A

N/A
Inspector (Print/Sign) Date

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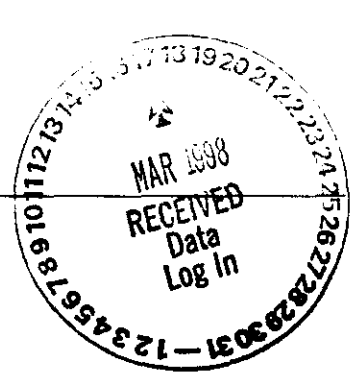
Virtual Laboratories Everywhere



Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD
RFW# :9801L314
SDG# : H0132

W.O. # : 10985-001-001-9999-00
Date Received: 01-29-98

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 1 water sample.

2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary. For NPDES samples: Ammonia distillations for method 350.3 were not performed as specified in 40 CFR part 136.

3. Sample holding times as required by the method and/or contract were met.

4. The cooler temperature was recorded on the chain-of-custody.

5. The method blanks were within method criteria.

6. The Laboratory Control Samples (LCS) for Ammonia and LCS duplicate for Oil and Grease were within the laboratory control limits (LCL), however the LCS 98LOG003-MB1 for Oil and Grease was below the LCL of 73.4-115.7%. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit, however LCS duplicate for Oil and Grease was outside the control limit. The LCS for Oil and Grease lost freon volume during the heating for distillation and therefore resulted in low spike recovery.

7. The matrix spike recoveries for Ammonia were within the 75-125% control limits. The matrix spike duplicate was within the 20% RPD control limit.

8. The replicate analyses were within the 20% RPD control limit.

Bruce C Hylton unit leader

for J. Michael Taylor
Vice President and Laboratory Manager
Lionville Analytical Laboratory

2-23-98
Date

njp\i01-314

02

WET CHEMISTRY METHODS GLOSSARY FOR ANALYSIS OF WATER SAMPLES

	EPA 600	SW846	OTHER
Acidity	_305.1		
_Alkalinity _Bicarbonate _Carbonate	_310.1		
BOD	_405.1		_5210B (b)
Ion Chromatography:			
_Bromide _Chloride _Fluoride	_300.0	_9056	
_Nitrite _Nitrate _Phosphate	_300.0	_9056	
_Sulfate _Formate _Acetate _Oxalate	_300.0	_9056	
Chloride	_325.2	_9251	
Chlorine Residual	_330.5 (mod)		
Cyanide Amenable to Chlorination	_335.2	_9010A	
Cyanide (Total)	_335.2	_9010A _9012	_ILM04.0 (e)
Cyanide, Weak Acid Dissociable			_412 (a) _4500CN-I (b)
COD	_410.4 (mod)		_5220 C (b)
Color	_110.2		
Corrosivity (by Coupon)		_1110 (mod)	
Chromium VI		_7196A	_3500Cr-D (b)
Fluoride	_340.2		
Hardness, Calcium	_215.2		
Hardness, Total	_130.2		
Iodide			_ASTM D19P202 (1)
Surfactant	_425.1		
_Nitrate-Nitrite _Nitrate _Nitrite	_353.2		
Ammonia	✓350.3		
Total _Kjeldahl Nitrogen _Organic Nitrogen	_351.4		
Total _Organic _Inorganic Carbon	_415.1	_9060	
Oil and Grease	✓413.1	_9070	
_pH _pH, Paper	_150.1	_9040A _9041A	
Petroleum Hydrocarbons, Total Recoverable	_418.1		
Phenol	_420.1 _420.2	_9065 _9066	
_Ortho Phosphate _Total Phosphate	_365.2		_4500-P B _C
Salinity			_210A (a) _2520B (b)
Settleable Solids	_160.5		
Sulfide	_376.2 _376.1	_9030A	
Reactive _Cyanide _Sulfide		_Sec 7.3	
Silica	_370.1		
Sulfite	_377.1		
Sulfate	_375.4	_9038	
Specific Conductance	_120.1	_9050	
Specific Gravity			_213E (a)
_TCLP _TCLV		_1311	
Synthetic Precipitation Leach		_1312	
Total _Dissolved _Suspended _Solids	160_.1_.2_.3		
Total Organic Halides	_450.1	_9020B	
Turbidity	_180.1		
Volatile Solids _Total _Dissolved _Suspended	_160.4		

Other:_____ Method:_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed., (1989).

b. Standard Methods for the Examination of Water and Waste, 17 ed., (1983)

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd. Ed. (1986)

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965)

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 02/10/98

CLIENT: TNU-HANFORD RECRA LOT #: 9801L314

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOMR91	Ammonia, as N	0.10 u	MG/L	0.10	1.0
		Oil & Grease Gravimetri	0.90 u	MG/L	0.90	1.0

Recra LabNet - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD

DATE RECEIVED: 01/29/98 RFW LOT # :9801L314

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BOMR91						
AMMONIA	001	W	98LAM006	01/26/98	02/03/98	02/03/98
AMMONIA	001 REP	W	98LAM006	01/26/98	02/03/98	02/03/98
AMMONIA	001 MS	W	98LAM006	01/26/98	02/03/98	02/03/98
AMMONIA	001 MSD	W	98LAM006	01/26/98	02/03/98	02/03/98
OIL & GREASE BY GRAV	001	W	98LOG003	01/26/98	02/05/98	02/05/98
OIL AND GREASE BY GR	001 REP	W	98LOG003	01/26/98	02/05/98	02/05/98
LAB QC:						
AMMONIA	MB1	W	98LAM006	N/A	02/03/98	02/03/98
AMMONIA	MB1 BS	W	98LAM006	N/A	02/03/98	02/03/98
AMMONIA	MB1 BSD	W	98LAM006	N/A	02/03/98	02/03/98
OIL & GREASE BY GRAV	MB1	W	98LOG003	N/A	02/05/98	02/05/98
OIL AND GREASE BY GR	MB1 BS	W	98LOG003	N/A	02/05/98	02/05/98
OIL AND GREASE BY GR	MB1 BSD	W	98LOG003	N/A	02/05/98	02/05/98

RECRA LabNet Use Only
98012314

Custody Transfer Record/Lab Work Request

RECRA LabNet

Client TNU - Hanford
Est. Final Proj. Sampling Date
Project # 10985-001-001-9999-00
Project Contact/Phone #
RECRA Project Manager K. C.
QC STD Del STD TAT 5? DAYs
Date Rec'd 1-29-98 Date Due 2-3-98
Account # TNUHANFORD

Refrigerator #					
#/Type Container	Liquid	2 (P)	2 (P)	2 (G)
	Solid			
Volume	Liquid	500 ml	500 ml	1L
	Solid			
Preservatives		HNO3	H2SO4	H2SO4
ANALYSES REQUESTED		CSG	Ammonia	Oil + Grease

ORGANIC: VOA, BNA, Pest/PCB, Herb — INORG: Metal, CN

RECRA LabNet Use Only: MCATO MPETO, 11NH3N, 10GSR

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	MS	MSD	Matrix	Date Collected	Time Collected	CSG	Ammonia	Oil + Grease
001	BOMR91	✓	✓	W	1-26-98	1249	✓	✓	✓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
RSA - CLIENT INFO
RMSC - COMP
SDG# H0132

Cooler Temp 4.1°

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Fed EX	J. [illegible]	1-29-98	0945				

Discrepancies Between Samples Lables and COC Record? Y or (N)
NOTES:

RECRA LabNet Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 8046 7241 2680
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

COC Tape was:
1) Present on Outer Package Y or (N)
2) Unbroken on Outer Package Y or (N)
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N

ORIGINAL
REWRITTEN